



Rec'd PCT/PTO

16 APR 2001

SEQUENCE LISTING

<110> Sim, Gek-Kee
Dreitz, Matthew J.

<120> T CELL RECEPTOR PROTEINS, NUCLEIC ACID MOLECULES, AND
USES THEREOF

<130> IM-3-C1-PCT

<140> not yet assigned

<141> 1999-07-29

<150> 60/094,506

<151> 1998-07-29

<160> 100

<170> WordPerfect for Windows 8.0

<210> 1

<211> 381

<212> DNA

<213> Canis familiaris

<220>

<221> CDS

<222> (1)..(381)

<400> 1

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| atc gga ctc ctc tgt ggt gtg gcc ttt tgt ttc ctg gga gta ggc ctt | 48 |
| Ile Gly Leu Leu Cys Gly Val Ala Phe Cys Phe Leu Gly Val Gly Leu | |
| 1 5 10 15 | |
| ttg aac gca caa gtg act caa acc ccg aga caa ctc atc aaa aaa gtg | 96 |
| Leu Asn Ala Gln Val Thr Gln Thr Pro Arg Gln Leu Ile Lys Lys Val | |
| 20 25 30 | |
| gga gcg aaa gtt ttg ttg aaa tgt tca cag aat atg gac cat gaa aga | 144 |
| Gly Ala Lys Val Leu Leu Lys Cys Ser Gln Asn Met Asp His Glu Arg | |
| 35 40 45 | |
| atg ttc tgg tat cga caa gac cca ggt ctg ggg ttg cgg ctg ctc tac | 192 |
| Met Phe Trp Tyr Arg Gln Asp Pro Gly Leu Gly Leu Arg Leu Leu Tyr | |
| 50 55 60 | |
| tgg tcc tat aat att gac agt gtt gag aca gga gac atc cct tat ggg | 240 |
| Trp Ser Tyr Asn Ile Asp Ser Val Glu Thr Gly Asp Ile Pro Tyr Gly | |
| 65 70 75 80 | |
| tac agt gtc tcg agg aag aag aag gat gcc ttc ccc ttg att ctg gag | 288 |
| Tyr Ser Val Ser Arg Lys Lys Lys Asp Ala Phe Pro Leu Ile Leu Glu | |
| 85 90 95 | |
| tct gct cgc atc aac cag aca tct gtg tac ttc tgc gcc agc agc ccg | 336 |
| Ser Ala Arg Ile Asn Gln Thr Ser Val Tyr Phe Cys Ala Ser Ser Pro | |

| | | | |
|---|-----|-----|-----|
| 100 | 105 | 110 | |
| ttt agc caa aat acc cag tac ttc ggg gcg ggc acc cgg ctg cta | | | 381 |
| Phe Ser Gln Asn Thr Gln Tyr Phe Gly Ala Gly Thr Arg Leu Leu | | | |
| 115 | 120 | 125 | |

<210> 2
 <211> 127
 <212> PRT
 <213> Canis familiaris

<400> 2
 Ile Gly Leu Leu Cys Gly Val Ala Phe Cys Phe Leu Gly Val Gly Leu
 1 5 10 15

Leu Asn Ala Gln Val Thr Gln Thr Pro Arg Gln Leu Ile Lys Lys Val
 20 25 30

Gly Ala Lys Val Leu Leu Lys Cys Ser Gln Asn Met Asp His Glu Arg
 35 40 45

Met Phe Trp Tyr Arg Gln Asp Pro Gly Leu Gly Leu Arg Leu Leu Tyr
 50 55 60

Trp Ser Tyr Asn Ile Asp Ser Val Glu Thr Gly Asp Ile Pro Tyr Gly
 65 70 75 80

Tyr Ser Val Ser Arg Lys Lys Lys Asp Ala Phe Pro Leu Ile Leu Glu
 85 90 95

Ser Ala Arg Ile Asn Gln Thr Ser Val Tyr Phe Cys Ala Ser Ser Pro
 100 105 110

Phe Ser Gln Asn Thr Gln Tyr Phe Gly Ala Gly Thr Arg Leu Leu
 115 120 125

<210> 3
 <211> 381
 <212> DNA
 <213> Canis familiaris

<400> 3
 tagcagccgg gtgccccgcc cgaagtactg ggtattttgg ctaaaccgggc tactggcgca 60
 gaagtacaca gatgtctggt tgatgcgagc agactccaga atcaagggga aggcattcctt 120
 cttcttcttc gagacactgt acccataagg gatgtctcct gtctcaacac tgtcaatatt 180
 ataggaccag tagagcagcc gcaaccccag acctgggtct tgcgataacc agaacattct 240
 ttcattgggtcc atattctgtg aacatttcaa caaaactttc gctcccactt ttttgatgag 300
 ttgtctcggg gtttgagtca cttgtgcgtt caaaaggcct actcccagga aacaaaaggc 360
 cacaccacag aggagtccga t 381

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Leu | Val | Ser | Gln | Lys | Pro | Arg | Arg | Asp | Ile | Cys | Gln | Arg | Gly | Thr |
| | | | 20 | | | | | 25 | | | | 30 | | | |
| Ser | Ile | Thr | Ile | His | Cys | Glu | Val | Asp | Thr | Gln | Val | Thr | Leu | Met | Phe |
| | | 35 | | | | | 40 | | | | 45 | | | | |
| Trp | Tyr | Arg | Gln | Leu | Pro | Gly | Gln | Ser | Leu | Ile | Leu | Ile | Ala | Thr | Ala |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Asn | Gln | Gly | Ala | Glu | Ala | Thr | Tyr | Glu | Ser | Gly | Phe | Thr | Arg | Glu | Lys |
| | 65 | | | | 70 | | | | | 75 | | | | 80 | |
| Phe | Pro | Ile | Ser | Arg | Arg | Thr | Leu | Met | Phe | Ser | Thr | Leu | Thr | Val | Ser |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Asn | Leu | Ser | Leu | Glu | Asp | Thr | Ser | Ser | Tyr | Phe | Cys | Ser | Ile | Trp | Tyr |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Gly | Glu | Gly | Glu | Gln | His | Phe | Gly | Pro | Gly | Thr | Arg | Leu | Thr | Val | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |

<210> 6
 <211> 408
 <212> DNA
 <213> Canis familiaris

<400> 6
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 gcagaagtaa gagctgggtgt cttcgaggct caggttgctc acagtcagag tggagaacat 120
 tagggttcgg cggtgatgg gaaacttctc cctggtaa at ccactttcgt aggtggcctc 180
 tgcaccctgg tttgcggttg caatcagtat caagctctgt cctgggagct gacggtagca 240
 gaacatcaag gtgacttggg tatcgacctc acagtggatg gtaatggagg tcccacgttg 300
 acagatgtcc ctgcgcggct tttgagagac aagagctcca aacacagagc cttgtcccag 360
 gaggagtagc aggcaagtca gcatctttag gtgctagccc ttcaccgt 408

<210> 7
 <211> 384
 <212> DNA
 <213> Canis familiaris

<400> 7
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 Met Leu Thr Cys Leu Leu Leu Leu Gly Gln Gly Ser Val Phe Gly
 1 5 10 15
 gct ctt gtc tct caa aag ccg cgc agg gac atc tgt caa cgt ggg acc 96
 Ala Leu Val Ser Gln Lys Pro Arg Arg Asp Ile Cys Gln Arg Gly Thr
 20 25 30

| | |
|---|-----|
| tcc att acc atc cac tgt gag gtc gat acc caa gtc acc ttg atg ttc | 144 |
| Ser Ile Thr Ile His Cys Glu Val Asp Thr Gln Val Thr Leu Met Phe | |
| 35 40 45 | |
| | |
| tgg tac cgt cag ctc cca gga cag agc ttg ata ctg att gca acc gca | 192 |
| Trp Tyr Arg Gln Leu Pro Gly Gln Ser Leu Ile Leu Ile Ala Thr Ala | |
| 50 55 60 | |
| | |
| aac cag ggt gca gag gcc acc tac gaa agt gga ttt acc agg gag aag | 240 |
| Asn Gln Gly Ala Glu Ala Thr Tyr Glu Ser Gly Phe Thr Arg Glu Lys | |
| 65 70 75 80 | |
| | |
| ttt ccc atc agc cgc cga acc cta atg ttc tcc act ctg act gtg agc | 288 |
| Phe Pro Ile Ser Arg Arg Thr Leu Met Phe Ser Thr Leu Thr Val Ser | |
| 85 90 95 | |
| | |
| aac ctg agc ctc gaa gac acc agc tct tac ttc tgc agc att tgg tac | 336 |
| Asn Leu Ser Leu Glu Asp Thr Ser Ser Tyr Phe Cys Ser Ile Trp Tyr | |
| 100 105 110 | |
| | |
| ggg gag ggg gag cag cac ttt ggg cca ggg acc cgg ctc acc gtc cta | 384 |
| Gly Glu Gly Glu Gln His Phe Gly Pro Gly Thr Arg Leu Thr Val Leu | |
| 115 120 125 | |

<210> 8

<211> 384

<212> DNA

<213> Canis familiaris

<400> 8

taggacgggtg agccgggtcc ctggcccaaa gtgctgctcc ccctccccgt accaaatgct 60

gcagaagtaa gagctgggtg ctctgaggct caggttgtc acagtcagag tggagaacat 120

tagggttcgg cggtgatgg gaaacttctc cctggtaa at ccactttcgt aggtggcctc 180

tgcaccctgg tttgcggttg caatcagtat caagctctgt cctgggagct gacgggtacca 240

gaacatcaag gtgacttggg tatcgacctc acagtggatg gtaatggagg tcccacgttg 300

acagatgtcc ctgcgcggct tttgagagac aagagctcca aacacagagc cttgtcccag 360

gaggagtagc aggcaagtca gcat 384

<210> 9

<211> 408

<212> DNA

<213> Canis familiaris

<220>

<221> CDS

<222> (7)..(408)

<400> 9

| | |
|--|----|
| gctgaa atg gcc acc ggc gtc ttc ttt ggc atg gct ctt tgt gtc ctg | 48 |
| Met Ala Thr Gly Val Phe Phe Gly Met Ala Leu Cys Val Leu | |
| 1 5 10 | |

| | |
|---|-----|
| tgg aca gga tac atg gat gct gga att atc cag agc cca aga tac aag | 96 |
| Trp Thr Gly Tyr Met Asp Ala Gly Ile Ile Gln Ser Pro Arg Tyr Lys | |
| 15 20 25 30 | |
| | |
| gtc aca ggg aca gga aag agg gtg act ctg aga tgt cac cag aca gac | 144 |
| Val Thr Gly Thr Gly Lys Arg Val Thr Leu Arg Cys His Gln Thr Asp | |
| 35 40 45 | |
| | |
| aac tat gac tat atg tac tgg tat cga cat gac ctg gga cat ggg ccg | 192 |
| Asn Tyr Asp Tyr Met Tyr Trp Tyr Arg His Asp Leu Gly His Gly Pro | |
| 50 55 60 | |
| | |
| agg ctg atc tat tat tca aat ggt att aac agc act gaa aaa gga gac | 240 |
| Arg Leu Ile Tyr Tyr Ser Asn Gly Ile Asn Ser Thr Glu Lys Gly Asp | |
| 65 70 75 | |
| | |
| ctc tcc aat gga tac aca gtc tct aga tca aac aag atg gat ttc ccc | 288 |
| Leu Ser Asn Gly Tyr Thr Val Ser Arg Ser Asn Lys Met Asp Phe Pro | |
| 80 85 90 | |
| | |
| ctc cta ctg gac tct gtt acc tcc tcc cag aca tct gtg tac ttc tgt | 336 |
| Leu Leu Leu Asp Ser Val Thr Ser Ser Gln Thr Ser Val Tyr Phe Cys | |
| 95 100 105 110 | |
| | |
| gcc gac acg agg gat cct gtt gca gta aat tat gat ttt aac ttt ggc | 384 |
| Ala Asp Thr Arg Asp Pro Val Ala Val Asn Tyr Asp Phe Asn Phe Gly | |
| 115 120 125 | |
| | |
| cca ggg acc aag ctg aca gtc gta | 408 |
| Pro Gly Thr Lys Leu Thr Val Val | |
| 130 | |

<210> 10
 <211> 134
 <212> PRT
 <213> Canis familiaris

| | |
|---|--|
| <400> 10 | |
| Met Ala Thr Gly Val Phe Phe Gly Met Ala Leu Cys Val Leu Trp Thr | |
| 1 5 10 15 | |
| | |
| Gly Tyr Met Asp Ala Gly Ile Ile Gln Ser Pro Arg Tyr Lys Val Thr | |
| 20 25 30 | |
| | |
| Gly Thr Gly Lys Arg Val Thr Leu Arg Cys His Gln Thr Asp Asn Tyr | |
| 35 40 45 | |
| | |
| Asp Tyr Met Tyr Trp Tyr Arg His Asp Leu Gly His Gly Pro Arg Leu | |
| 50 55 60 | |
| | |
| Ile Tyr Tyr Ser Asn Gly Ile Asn Ser Thr Glu Lys Gly Asp Leu Ser | |
| 65 70 75 80 | |
| | |
| Asn Gly Tyr Thr Val Ser Arg Ser Asn Lys Met Asp Phe Pro Leu Leu | |
| 85 90 95 | |

Leu Asp Ser Val Thr Ser Ser Gln Thr Ser Val Tyr Phe Cys Ala Asp
 100 105 110

Thr Arg Asp Pro Val Ala Val Asn Tyr Asp Phe Asn Phe Gly Pro Gly
 115 120 125

Thr Lys Leu Thr Val Val
 130

<210> 11
 <211> 408
 <212> DNA
 <213> Canis familiaris

<400> 11
 tacgactgtc agcttggtcc ctggggccaaa gttaaaatca taattttactg caacaggatc 60
 cctcgtgtcg gcacagaagt acacagatgt ctgggaggag gtaacagagt ccagtaggag 120
 ggggaaatcc atcttggttg atctagagac tgtgtatcca ttggagaggt ctcctttttc 180
 agtgctgtta ataccatttg aataatagat cagcctcggc ccatgtccca ggtcatgtcg 240
 ataccagtac atatagtcac agttgtctgt ctgggtgacat ctcagagtca ccctctttcc 300
 tgccctgtg accttgatc ttgggctctg gataattcca gcatccatgt atcctgtcca 360
 caggacacaa agagccatgc caaagaagac gccggtggcc atttcagc 408

<210> 12
 <211> 402
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS
 <222> (1)..(402)

<400> 12
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 Met Ala Thr Gly Val Phe Phe Gly Met Ala Leu Cys Val Leu Trp Thr
 1 5 10 15
 gga tac atg gat gct gga att atc cag agc cca aga tac aag gtc aca 96
 Gly Tyr Met Asp Ala Gly Ile Ile Gln Ser Pro Arg Tyr Lys Val Thr
 20 25 30
 ggg aca gga aag agg gtg act ctg aga tgt cac cag aca gac aac tat 144
 Gly Thr Gly Lys Arg Val Thr Leu Arg Cys His Gln Thr Asp Asn Tyr
 35 40 45
 gac tat atg tac tgg tat cga cat gac ctg gga cat ggg ccg agg ctg 192
 Asp Tyr Met Tyr Trp Tyr Arg His Asp Leu Gly His Gly Pro Arg Leu

| 50 | 55 | 60 | |
|---|-----|-----|-----|
| atc tat tat tca aat ggt att aac agc act gaa aaa gga gac ctc tcc | | | 240 |
| Ile Tyr Tyr Ser Asn Gly Ile Asn Ser Thr Glu Lys Gly Asp Leu Ser | | | |
| 65 | 70 | 75 | 80 |
| aat gga tac aca gtc tct aga tca aac aag atg gat ttc ccc ctc cta | | | 288 |
| Asn Gly Tyr Thr Val Ser Arg Ser Asn Lys Met Asp Phe Pro Leu Leu | | | |
| | 85 | 90 | 95 |
| ctg gac tct gtt acc tcc tcc cag aca tct gtg tac ttc tgt gcc gac | | | 336 |
| Leu Asp Ser Val Thr Ser Ser Gln Thr Ser Val Tyr Phe Cys Ala Asp | | | |
| | 100 | 105 | 110 |
| acg agg gat cct gtt gca gta aat tat gat ttt aac ttt ggc cca ggg | | | 384 |
| Thr Arg Asp Pro Val Ala Val Asn Tyr Asp Phe Asn Phe Gly Pro Gly | | | |
| | 115 | 120 | 125 |
| acc aag ctg aca gtc gta | | | 402 |
| Thr Lys Leu Thr Val Val | | | |
| 130 | | | |

<210> 13
 <211> 402
 <212> DNA
 <213> Canis familiaris

<400> 13
 tacgactgtc agcttgggtcc ctggggccaaa gttaaaatca taatttactg caacaggatc 60
 cctcgtgtcg gcacagaagt acacagatgt ctgggaggag gtaacagagt ccagtaggag 120
 ggggaaatcc atcttgtttg atctagagac tgtgtatcca ttggagaggt ctccctttttc 180
 agtgctgtta ataccatttg aataatagat cagcctcggc ccatgtccca ggcatgtcg 240
 ataccagtac atatagtcac agttgtctgt ctggtgacat ctcagagtca cccctctttcc 300
 tgccctgtg accttgatc ttgggctctg gataattcca gcatccatgt atcctgtcca 360
 caggacacaa agagccatgc caaagaagac gccggtggcc at 402

<210> 14
 <211> 483
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS
 <222> (85)..(483)

<400> 14
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ggctatcagc ttcccagggc tgcc atg ggc tcc agg ctt ctc tgc tgt gtg 111
Met Gly Ser Arg Leu Leu Cys Cys Val
1 5

gcc ctt tgt ctc ctg gga gcc ggc ccc gtg gag tct gag gtc atc caa 159
Ala Leu Cys Leu Leu Gly Ala Gly Pro Val Glu Ser Glu Val Ile Gln
10 15 20 25

act cca aga cac atg atc aaa gca aga gga cag aca gtg acc ctg aga 207
Thr Pro Arg His Met Ile Lys Ala Arg Gly Gln Thr Val Thr Leu Arg
30 35 40

tgt tcc ctt atc tct gga cac cta tct gtg tac tgg tac caa cag gcc 255
Cys Ser Leu Ile Ser Gly His Leu Ser Val Tyr Trp Tyr Gln Gln Ala
45 50 55

ctg ggc cag ggt ccc cgg ttt ctc att cag tat tac aat agg gaa gag 303
Leu Gly Gln Gly Pro Arg Phe Leu Ile Gln Tyr Tyr Asn Arg Glu Glu
60 65 70

aga gac aaa gga gac atc ccg gca aga ttc tca gtg cag cag ttc agt 351
Arg Asp Lys Gly Asp Ile Pro Ala Arg Phe Ser Val Gln Gln Phe Ser
75 80 85

aac tac agc tcc cag ctg gag atg aac tcc ctg gag cca gga gac tca 399
Asn Tyr Ser Ser Gln Leu Glu Met Asn Ser Leu Glu Pro Gly Asp Ser
90 95 100 105

gcc cta tat ctc tgt gcc agc agc tta gat gcg ttc gac gcg ggg cag 447
Ala Leu Tyr Leu Cys Ala Ser Ser Leu Asp Ala Phe Asp Ala Gly Gln
110 115 120

ctg tac ttc ggg gcc ggt tcc aag ctg gcc gtg ctg 483
Leu Tyr Phe Gly Ala Gly Ser Lys Leu Ala Val Leu
125 130

<210> 15

<211> 133

<212> PRT

<213> Canis familiaris

<400> 15

Met Gly Ser Arg Leu Leu Cys Cys Val Ala Leu Cys Leu Leu Gly Ala
1 5 10 15

Gly Pro Val Glu Ser Glu Val Ile Gln Thr Pro Arg His Met Ile Lys
20 25 30

Ala Arg Gly Gln Thr Val Thr Leu Arg Cys Ser Leu Ile Ser Gly His
35 40 45

Leu Ser Val Tyr Trp Tyr Gln Gln Ala Leu Gly Gln Gly Pro Arg Phe
50 55 60

Leu Ile Gln Tyr Tyr Asn Arg Glu Glu Arg Asp Lys Gly Asp Ile Pro

| | | | | | | |
|---|-----|----|-----|----|-----|----|
| 65 | | 70 | | 75 | | 80 |
| Ala Arg Phe Ser Val Gln Gln Phe Ser Asn Tyr Ser Ser Gln Leu Glu | | | | | | |
| | 85 | | 90 | | 95 | |
| Met Asn Ser Leu Glu Pro Gly Asp Ser Ala Leu Tyr Leu Cys Ala Ser | | | | | | |
| | 100 | | 105 | | 110 | |
| Ser Leu Asp Ala Phe Asp Ala Gly Gln Leu Tyr Phe Gly Ala Gly Ser | | | | | | |
| | 115 | | 120 | | 125 | |
| Lys Leu Ala Val Leu | | | | | | |
| | 130 | | | | | |

<210> 16
 <211> 483
 <212> DNA
 <213> Canis familiaris

<400> 16
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 gctgctggca cagagatata gggctgagtc tcttggtcc agggagtcca tctccagctg 120
 ggagctgtag ttactgaact gctgcactga gaatcttgcc gggatgtctc ctttgtctct 180
 ctcttccta ttgtaatact gaatgagaaa cgggggaccc tggcccagg cctgttggtta 240
 ccagtaacaca gataggtgtc cagagataag ggaacatctc agggtcactg tctgtcctct 300
 tgctttgatc atgtgtcttg gagtttgat gacctcagac tccacggggc cggctcccag 360
 gagacaaagg gccacacagc agagaagcct ggagcccatg gcagccctgg gaagctgata 420
 gcctccccgc tctcgtgcc gcggtggagc tccagctttt gttcccttta gtgagggtta 480
 att 483

<210> 17
 <211> 399
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS
 <222> (1)..(399)

<400> 17
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 Met Gly Ser Arg Leu Leu Cys Cys Val Ala Leu Cys Leu Leu Gly Ala
 1 5 10 15
 ggc ccc gtg gag tct gag gtc atc caa act cca aga cac atg atc aaa 96
 Gly Pro Val Glu Ser Glu Val Ile Gln Thr Pro Arg His Met Ile Lys
 20 25 30

| | |
|---|-----|
| gca aga gga cag aca gtg acc ctg aga tgt tcc ctt atc tct gga cac | 144 |
| Ala Arg Gly Gln Thr Val Thr Leu Arg Cys Ser Leu Ile Ser Gly His | |
| 35 40 45 | |
| | |
| cta tct gtg tac tgg tac caa cag gcc ctg ggc cag ggt ccc cgg ttt | 192 |
| Leu Ser Val Tyr Trp Tyr Gln Gln Ala Leu Gly Gln Gly Pro Arg Phe | |
| 50 55 60 | |
| | |
| ctc att cag tat tac aat agg gaa gag aga gac aaa gga gac atc ccg | 240 |
| Leu Ile Gln Tyr Tyr Asn Arg Glu Glu Arg Asp Lys Gly Asp Ile Pro | |
| 65 70 75 80 | |
| | |
| gca aga ttc tca gtg cag cag ttc agt aac tac agc tcc cag ctg gag | 288 |
| Ala Arg Phe Ser Val Gln Gln Phe Ser Asn Tyr Ser Ser Gln Leu Glu | |
| 85 90 95 | |
| | |
| atg aac tcc ctg gag cca gga gac tca gcc cta tat ctc tgt gcc agc | 336 |
| Met Asn Ser Leu Glu Pro Gly Asp Ser Ala Leu Tyr Leu Cys Ala Ser | |
| 100 105 110 | |
| | |
| agc tta gat gcg ttc gac gcg ggg cag ctg tac ttc ggg gcc ggt tcc | 384 |
| Ser Leu Asp Ala Phe Asp Ala Gly Gln Leu Tyr Phe Gly Ala Gly Ser | |
| 115 120 125 | |
| | |
| aag ctg gcc gtg ctg | 399 |
| Lys Leu Ala Val Leu | |
| 130 | |

<210> 18
 <211> 399
 <212> DNA
 <213> Canis familiaris

<400> 18
 cagcacggcc agcttggaac cggccccgaa gtacagctgc cccgcgtcga acgcatctaa 60

 gctgctggca cagagatata gggctgagtc tccctggctcc agggagtcca tctccagctg 120
 ggagctgtag ttactgaact gctgcactga gaatcttgcc gggatgtctc ctttgtctct 180

 ctcttcctta ttgtaatact gaatgagaaa ccggggaccc tggcccaggg cctgttggtgta 240

 ccagtaacaca gataggtgtc cagagataag ggaacatctc agggtcactg tctgtcctct 300

 tgctttgatc atgtgtcttg gagtttgat gacctcagac tccacggggc cggctcccag 360

 gagacaaagg gccacacagc agagaagcct ggagcccat 399

<210> 19
 <211> 462
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS

<222> (73)..(462)

<400> 19

gctgcaggat tcggcacgag gcgtgggtcat atctatcttg agagaggtat ggtatgaggc 60

catcacctga ag atg ctg atg ctt ctg ctg ctc ctg ggg ccc agc tct gga 111
Met Leu Met Leu Leu Leu Leu Leu Gly Pro Ser Ser Gly

1

5

10

ctc ggt gcc ctc gtc ttc cag gcg ccc agc aca atg atc tgt aag agc 159
Leu Gly Ala Leu Val Phe Gln Ala Pro Ser Thr Met Ile Cys Lys Ser
15 20 25

gga gcc acc gtg cag atc cag tgt caa aca gtg gac ctt caa gcc aca 207
Gly Ala Thr Val Gln Ile Gln Cys Gln Thr Val Asp Leu Gln Ala Thr
30 35 40 45

acc gtg ttt tgg tat cgc cag ctc ccg aag cag ggc ctt acc ctt atg 255
Thr Val Phe Trp Tyr Arg Gln Leu Pro Lys Gln Gly Leu Thr Leu Met
50 55 60

gtg acc tct aac gtg ggc aac agt gct aca cac gag cag ggg ttc cct 303
Val Thr Ser Asn Val Gly Asn Ser Ala Thr His Glu Gln Gly Phe Pro
65 70 75

gca gcc aag ttc cct gtt aac cac cca aac ctc acg ttt tcc tcc ctg 351
Ala Ala Lys Phe Pro Val Asn His Pro Asn Leu Thr Phe Ser Ser Leu
80 85 90

atg gtg acg agt tca ggt cct gga gac agc ggc ctc tac ttc tgt ggt 399
Met Val Thr Ser Ser Gly Pro Gly Asp Ser Gly Leu Tyr Phe Cys Gly
95 100 105

gtt cgg gcg tat ggt ggg aac tcg ccc ctc tac ttt gga aca ggc acc 447
Val Arg Ala Tyr Gly Gly Asn Ser Pro Leu Tyr Phe Gly Thr Gly Thr
110 115 120 125

agg ctc acc gtg aca 462
Arg Leu Thr Val Thr
130

<210> 20

<211> 130

<212> PRT

<213> Canis familiaris

<400> 20

Met Leu Met Leu Leu Leu Leu Leu Gly Pro Ser Ser Gly Leu Gly Ala
1 5 10 15

Leu Val Phe Gln Ala Pro Ser Thr Met Ile Cys Lys Ser Gly Ala Thr
20 25 30

Val Gln Ile Gln Cys Gln Thr Val Asp Leu Gln Ala Thr Thr Val Phe
35 40 45

Trp Tyr Arg Gln Leu Pro Lys Gln Gly Leu Thr Leu Met Val Thr Ser
 50 55 60
 Asn Val Gly Asn Ser Ala Thr His Glu Gln Gly Phe Pro Ala Ala Lys
 65 70 75 80
 Phe Pro Val Asn His Pro Asn Leu Thr Phe Ser Ser Leu Met Val Thr
 85 90 95
 Ser Ser Gly Pro Gly Asp Ser Gly Leu Tyr Phe Cys Gly Val Arg Ala
 100 105 110
 Tyr Gly Gly Asn Ser Pro Leu Tyr Phe Gly Thr Gly Thr Arg Leu Thr
 115 120 125
 Val Thr
 130

<210> 21
 <211> 462
 <212> DNA
 <213> Canis familiaris

<400> 21
 tgtcacggtg agcctggtgc ctgttccaaa gtagaggggc gagttccac catacgcccg 60
 aacaccacag aagtagaggc cgctgtctcc aggacctgaa ctcgtcacca tcagggagga 120
 aaacgtgagg tttgggtggt taacagggaa cttggctgca gggaaccct gctcgtgtgt 180
 agcactgttg cccacgttag aggtcaccat aagggttaagg ccctgcttcg ggagctggcg 240
 ataccaaaac acggttggtg cttgaaggtc cactgtttga cactggatct gcacggtggc 300
 tccgctctta cagatcattg tgctgggctc ctggaagacg agggcaccga gtccagagct 360
 gggccccagg agcagcagaa gcatcagcat cttcaggtga tggcctcata ccatacctct 420
 ctcaagatag atatgaccac gcctcgtgcc gaatcctgca gc 462

<210> 22
 <211> 417
 <212> DNA
 <213> Canis familiaris
 <220>
 <221> CDS
 <222> (13)..(417)

<400> 22
 cacgagcctg cc atg tgc cca gtg ttc atc tgc tcc ttg gtc ctc tgg ctc 51
 Met Cys Pro Val Phe Ile Cys Ser Leu Val Leu Trp Leu
 1 5 10
 ctg agt aca ggc acc ctc aat gca aaa gtc atg cag act cca gga cat 99

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ser | Thr | Gly | Thr | Leu | Asn | Ala | Lys | Val | Met | Gln | Thr | Pro | Gly | His | |
| 15 | | | | | | 20 | | | | | 25 | | | | | |
| ctg | gtc | aaa | ggg | aaa | gga | caa | aaa | gca | aaa | atg | gaa | tgt | gtc | cca | ata | 147 |
| Leu | Val | Lys | Gly | Lys | Gly | Gln | Lys | Ala | Lys | Met | Glu | Cys | Val | Pro | Ile | |
| 30 | | | | | 35 | | | | | 40 | | | | | 45 | |
| aaa | gga | cat | agt | tat | gtt | ttc | tgg | tat | cag | cag | atc | cca | gca | aaa | gag | 195 |
| Lys | Gly | His | Ser | Tyr | Val | Phe | Trp | Tyr | Gln | Gln | Ile | Pro | Ala | Lys | Glu | |
| | | | | 50 | | | | | 55 | | | | | 60 | | |
| ttc | aag | ttc | ttg | att | tct | ttc | cag | gat | aac | gct | gtc | ttt | gat | aaa | aca | 243 |
| Phe | Lys | Phe | Leu | Ile | Ser | Phe | Gln | Asp | Asn | Ala | Val | Phe | Asp | Lys | Thr | |
| | | | 65 | | | | | 70 | | | | | 75 | | | |
| ggg | atg | ccc | acg | cag | aga | ttt | tta | gcc | ttg | tgt | cca | aaa | aac | cta | ccc | 291 |
| Gly | Met | Pro | Thr | Gln | Arg | Phe | Leu | Ala | Leu | Cys | Pro | Lys | Asn | Leu | Pro | |
| | | 80 | | | | | 85 | | | | | 90 | | | | |
| tgt | agc | cta | gag | atc | gag | cgt | aca | gag | ctg | cag | gat | tca | gcc | gtg | tat | 339 |
| Cys | Ser | Leu | Glu | Ile | Glu | Arg | Thr | Glu | Leu | Gln | Asp | Ser | Ala | Val | Tyr | |
| | 95 | | | | | 100 | | | | | 105 | | | | | |
| ttt | tgt | gcc | agc | agt | gac | aga | act | ggg | gga | ctc | gtt | cac | gag | cag | tat | 387 |
| Phe | Cys | Ala | Ser | Ser | Asp | Arg | Thr | Gly | Gly | Leu | Val | His | Glu | Gln | Tyr | |
| 110 | | | | | 115 | | | | | 120 | | | | 125 | | |
| ttc | ggc | gcc | ggc | acc | agg | ctc | acg | gtc | ctc | | | | | | | 417 |
| Phe | Gly | Ala | Gly | Thr | Arg | Leu | Thr | Val | Leu | | | | | | | |
| | | | 130 | | | | | 135 | | | | | | | | |

<210> 23
 <211> 135
 <212> PRT
 <213> Canis familiaris

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | Cys | Pro | Val | Phe | Ile | Cys | Ser | Leu | Val | Leu | Trp | Leu | Leu | Ser | Thr | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| Gly | Thr | Leu | Asn | Ala | Lys | Val | Met | Gln | Thr | Pro | Gly | His | Leu | Val | Lys | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| Gly | Lys | Gly | Gln | Lys | Ala | Lys | Met | Glu | Cys | Val | Pro | Ile | Lys | Gly | His | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| Ser | Tyr | Val | Phe | Trp | Tyr | Gln | Gln | Ile | Pro | Ala | Lys | Glu | Phe | Lys | Phe | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| Leu | Ile | Ser | Phe | Gln | Asp | Asn | Ala | Val | Phe | Asp | Lys | Thr | Gly | Met | Pro | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | |
| Thr | Gln | Arg | Phe | Leu | Ala | Leu | Cys | Pro | Lys | Asn | Leu | Pro | Cys | Ser | Leu | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Ile | Glu | Arg | Thr | Glu | Leu | Gln | Asp | Ser | Ala | Val | Tyr | Phe | Cys | Ala |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Ser | Ser | Asp | Arg | Thr | Gly | Gly | Leu | Val | His | Glu | Gln | Tyr | Phe | Gly | Ala |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Gly | Thr | Arg | Leu | Thr | Val | Leu | | | | | | | | | |
| | 130 | | | | | 135 | | | | | | | | | |

<210> 24
 <211> 417
 <212> DNA
 <213> Canis familiaris

<400> 24
 gaggaccgtg agcctgggtgc cggcgccgaa atactgctcg tgaacgagtc cccagttct 60
 gtcactgctg gcacaaaaat acacggctga atcctgcagc tctgtacgct cgatctctag 120
 gctacagggt aggttttttg gacacaaggc taaaaatctc tgcgtgggca tccctgtttt 180
 atcaaagaca gcgttatcct ggaaagaaat caagaacttg aactcttttg ctgggatctg 240
 ctgataccag aaaacataac tatgtccttt tattgggaca cattccattt ttgctttttg 300
 tcctttccct ttgaccagat gtcctggagt ctgcatgact tttgcattga gggcgccctgt 360
 actcaggagc cagaggacca aggagcagat gaacactggg cacatggcag gctcgtg 417

<210> 25
 <211> 423
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS
 <222> (40)..(423)

<400> 25
 ggcacgagca ctgaggacca gactgtgcct gtctccacc atg ggc tcc ggg ttc 54
 Met Gly Ser Gly Phe
 1 5
 ctc tgc tgt atg gtc ctc tgc ctc ctg gga gca gca ccc ctg gac aca 102
 Leu Cys Cys Met Val Leu Cys Leu Leu Gly Ala Ala Pro Leu Asp Thr
 10 15 20
 aca gtt tcc cag act cca aga tac ctc atc gcg cac gtg gga tcg aag 150
 Thr Val Ser Gln Thr Pro Arg Tyr Leu Ile Ala His Val Gly Ser Lys
 25 30 35
 aag tta cta aaa tgt gag caa aat ctg ggc cat aat gct atg tac tgg 198
 Lys Leu Leu Lys Cys Glu Gln Asn Leu Gly His Asn Ala Met Tyr Trp
 40 45 50

| | |
|---|-----|
| tat aag caa gac ctc aag caa ctg ctg aag atc atg ttt atc tac ttt | 246 |
| Tyr Lys Gln Asp Leu Lys Gln Leu Leu Lys Ile Met Phe Ile Tyr Phe | |
| 55 60 65 | |

| | |
|---|-----|
| aat cag gga ctc aat cta aat gaa tca gtt cca ggt cgt ttc tca cct | 294 |
| Asn Gln Gly Leu Asn Leu Asn Glu Ser Val Pro Gly Arg Phe Ser Pro | |
| 70 75 80 85 | |

| | |
|---|-----|
| gag aca ctg aca agc tca tta act tca tgt cga ctc ctg aac agt gac | 342 |
| Glu Thr Leu Thr Ser Ser Leu Thr Ser Cys Arg Leu Leu Asn Ser Asp | |
| 90 95 100 | |

| | |
|---|-----|
| tct gct gtg tat ttc tgt gcc agc agc gag ggg tat gat gaa aaa ttg | 390 |
| Ser Ala Val Tyr Phe Cys Ala Ser Ser Glu Gly Tyr Asp Glu Lys Leu | |
| 105 110 115 | |

| | |
|---|-----|
| tat ttt gca agt gga acc aag ctt tct gtc ttg | 423 |
| Tyr Phe Ala Ser Gly Thr Lys Leu Ser Val Leu | |
| 120 125 | |

<210> 26
 <211> 128
 <212> PRT
 <213> Canis familiaris

| | |
|---|--|
| <400> 26 | |
| Met Gly Ser Gly Phe Leu Cys Cys Met Val Leu Cys Leu Leu Gly Ala | |
| 1 5 10 15 | |

| | |
|---|--|
| Ala Pro Leu Asp Thr Thr Val Ser Gln Thr Pro Arg Tyr Leu Ile Ala | |
| 20 25 30 | |

| | |
|---|--|
| His Val Gly Ser Lys Lys Leu Leu Lys Cys Glu Gln Asn Leu Gly His | |
| 35 40 45 | |

| | |
|---|--|
| Asn Ala Met Tyr Trp Tyr Lys Gln Asp Leu Lys Gln Leu Leu Lys Ile | |
| 50 55 60 | |

| | |
|---|--|
| Met Phe Ile Tyr Phe Asn Gln Gly Leu Asn Leu Asn Glu Ser Val Pro | |
| 65 70 75 80 | |

| | |
|---|--|
| Gly Arg Phe Ser Pro Glu Thr Leu Thr Ser Ser Leu Thr Ser Cys Arg | |
| 85 90 95 | |

| | |
|---|--|
| Leu Leu Asn Ser Asp Ser Ala Val Tyr Phe Cys Ala Ser Ser Glu Gly | |
| 100 105 110 | |

| | |
|---|--|
| Tyr Asp Glu Lys Leu Tyr Phe Ala Ser Gly Thr Lys Leu Ser Val Leu | |
| 115 120 125 | |

<210> 27
 <211> 423
 <212> DNA
 <213> Canis familiaris

<400> 27
caagacagaaa agcttggttc cacttgcaaa atacaatttt tcatcataacc cctcgctgct 60
ggcacagaaa tacacagcag agtcactgtt caggagtcga catgaagtta atgagcttgt 120
cagtgtctca ggtgagaaac gacctggaac tgattcattt agattgagtc cctgattaaa 180
gtagataaac atgatcttca gcagttgctt gaggtcttgc ttataccagt acatagcatt 240
atggcccaga ttttgtcac attttagtaa cttcttcgat cccacgtgcg cgatgaggta 300
tcttgagtc tgggaaactg ttgtgtccag ggggtgctgct cccaggaggc agaggaccat 360
acagcagagg aacccggagc ccatggtgga gacaggcaca gtctggtcct cagtgtctgt 420
gcc 423

<210> 28
<211> 333
<212> DNA
<213> Canis familiaris

<220>
<221> CDS
<222> (1)..(333)

<400> 28
atc gga ctc ctc tgt ggt gtg gcc ttt tgt ttc ctg gga gta ggc ctt 48
Ile Gly Leu Leu Cys Gly Val Ala Phe Cys Phe Leu Gly Val Gly Leu
1 5 10 15
ttg aac gca caa gtg act caa acc ccg aga caa ctc atc aaa aaa gtg 96
Leu Asn Ala Gln Val Thr Gln Thr Pro Arg Gln Leu Ile Lys Lys Val
20 25 30
gga gcg aaa gtt ttg ttg aaa tgt tca cag aat atg gac cat gaa aga 144
Gly Ala Lys Val Leu Leu Lys Cys Ser Gln Asn Met Asp His Glu Arg
35 40 45
atg ttc tgg tat cga caa gac cca ggt ctg ggg ttg cgg ctg ctc tac 192
Met Phe Trp Tyr Arg Gln Asp Pro Gly Leu Gly Leu Arg Leu Leu Tyr
50 55 60
tgg tcc tat aat att gac agt gtt gag aca gga gac atc cct tat ggg 240
Trp Ser Tyr Asn Ile Asp Ser Val Glu Thr Gly Asp Ile Pro Tyr Gly
65 70 75 80
tac agt gtc tcg agg aag aag aag gat gcc ttc ccc ttg att ctg gag 288
Tyr Ser Val Ser Arg Lys Lys Lys Asp Ala Phe Pro Leu Ile Leu Glu
85 90 95
tct gct cgc atc aac cag aca tct gtg tac ttc tgc gcc agc agc 333
Ser Ala Arg Ile Asn Gln Thr Ser Val Tyr Phe Cys Ala Ser Ser
100 105 110

<210> 29
 <211> 111
 <212> PRT
 <213> Canis familiaris
 <400> 29
 Ile Gly Leu Leu Cys Gly Val Ala Phe Cys Phe Leu Gly Val Gly Leu
 1 5 10 15
 Leu Asn Ala Gln Val Thr Gln Thr Pro Arg Gln Leu Ile Lys Lys Val
 20 25 30
 Gly Ala Lys Val Leu Leu Lys Cys Ser Gln Asn Met Asp His Glu Arg
 35 40 45
 Met Phe Trp Tyr Arg Gln Asp Pro Gly Leu Gly Leu Arg Leu Leu Tyr
 50 55 60
 Trp Ser Tyr Asn Ile Asp Ser Val Glu Thr Gly Asp Ile Pro Tyr Gly
 65 70 75 80
 Tyr Ser Val Ser Arg Lys Lys Lys Asp Ala Phe Pro Leu Ile Leu Glu
 85 90 95
 Ser Ala Arg Ile Asn Gln Thr Ser Val Tyr Phe Cys Ala Ser Ser
 100 105 110

<210> 30
 <211> 333
 <212> DNA
 <213> Canis familiaris
 <400> 30
 gctactggcg cagaagtaca cagatgtctg gttgatgcga gcagactcca gaatcaaggg 60
 gaaggcatcc ttcttcttcc tcgagacact gtacccataa gggatgtctc ctgtctcaac 120
 actgtcaata ttataggacc agtagagcag ccgcaacccc agacctgggt cttgtcgata 180
 ccagaacatt ctttcatggt ccatattctg tgaacatttc aacaaaactt tcgctccac 240
 ttttttgatg agttgtctcg gggtttgagt cacttgtgcg ttcaaaaggc ctactcccag 300
 gaaacaaaag gccacaccac agaggagtcc gat 333

<210> 31
 <211> 351
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS
 <222> (25) .. (351)

<400> 31
 acggtgaagg gctagcacct aaag atg ctg act tgc ctg cta ctc ctc ctg 51

Met Leu Thr Cys Leu Leu Leu Leu Leu
1 5

gga caa ggc tct gtg ttt gga gct ctt gtc tct caa aag ccg cgc agg 99
Gly Gln Gly Ser Val Phe Gly Ala Leu Val Ser Gln Lys Pro Arg Arg
10 15 20 25

gac atc tgt caa cgt ggg acc tcc att acc atc cac tgt gag gtc gat 147
Asp Ile Cys Gln Arg Gly Thr Ser Ile Thr Ile His Cys Glu Val Asp
30 35 40

acc caa gtc acc ttg atg ttc tgg tac cgt cag ctc cca gga cag agc 195
Thr Gln Val Thr Leu Met Phe Trp Tyr Arg Gln Leu Pro Gly Gln Ser
45 50 55

ttg ata ctg att gca acc gca aac cag ggt gca gag gcc acc tac gaa 243
Leu Ile Leu Ile Ala Thr Ala Asn Gln Gly Ala Glu Ala Thr Tyr Glu
60 65 70

agt gga ttt acc agg gag aag ttt ccc atc agc cgc cga acc cta atg 291
Ser Gly Phe Thr Arg Glu Lys Phe Pro Ile Ser Arg Arg Thr Leu Met
75 80 85

ttc tcc act ctg act gtg agc aac ctg agc ctc gaa gac acc agc tct 339
Phe Ser Thr Leu Thr Val Ser Asn Leu Ser Leu Glu Asp Thr Ser Ser
90 95 100 105

tac ttc tgc agc 351
Tyr Phe Cys Ser

<210> 32
<211> 109
<212> PRT
<213> Canis familiaris

<400> 32
Met Leu Thr Cys Leu Leu Leu Leu Leu Gly Gln Gly Ser Val Phe Gly
1 5 10 15

Ala Leu Val Ser Gln Lys Pro Arg Arg Asp Ile Cys Gln Arg Gly Thr
20 25 30

Ser Ile Thr Ile His Cys Glu Val Asp Thr Gln Val Thr Leu Met Phe
35 40 45

Trp Tyr Arg Gln Leu Pro Gly Gln Ser Leu Ile Leu Ile Ala Thr Ala
50 55 60

Asn Gln Gly Ala Glu Ala Thr Tyr Glu Ser Gly Phe Thr Arg Glu Lys
65 70 75 80

Phe Pro Ile Ser Arg Arg Thr Leu Met Phe Ser Thr Leu Thr Val Ser
85 90 95

Asn Leu Ser Leu Glu Asp Thr Ser Ser Tyr Phe Cys Ser

<210> 33
 <211> 351
 <212> DNA
 <213> Canis familiaris

<400> 33
 gctgcagaag taagagctgg tgtcttcgag gctcagggtg ctcacagtca gagtggagaa 60
 cattaggggtt cggcggctga tgggaaactt ctccctggta aatccacttt cgtaggtggc 120
 ctctgcaccc tggtttgccg ttgcaatcag tatcaagctc tgtcctggga gctgacggta 180
 ccagaacatc aagggtgactt gggatatcgac ctcacagtgg atggtaatgg aggtcccacg 240
 ttgacagatg tccctgcgcg gcttttgaga gacaagagct ccaaacacag agccttgctc 300
 caggaggagt agcaggcaag tcagcatctt taggtgctag cccttcaccg t 351

<210> 34
 <211> 339
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS
 <222> (7)..(339)

<400> 34
 gctgaa atg gcc acc ggc gtc ttc ttt ggc atg gct ctt tgt gtc ctg 48
 Met Ala Thr Gly Val Phe Phe Gly Met Ala Leu Cys Val Leu
 1 5 10
 tgg aca gga tac atg gat gct gga att atc cag agc cca aga tac aag 96
 Trp Thr Gly Tyr Met Asp Ala Gly Ile Ile Gln Ser Pro Arg Tyr Lys
 15 20 25 30
 gtc aca ggg aca gga aag agg gtg act ctg aga tgt cac cag aca gac 144
 Val Thr Gly Thr Gly Lys Arg Val Thr Leu Arg Cys His Gln Thr Asp
 35 40 45
 aac tat gac tat atg tac tgg tat cga cat gac ctg gga cat ggg ccg 192
 Asn Tyr Asp Tyr Met Tyr Trp Tyr Arg His Asp Leu Gly His Gly Pro
 50 55 60
 agg ctg atc tat tat tca aat ggt att aac agc act gaa aaa gga gac 240
 Arg Leu Ile Tyr Tyr Ser Asn Gly Ile Asn Ser Thr Glu Lys Gly Asp
 65 70 75
 ctc tcc aat gga tac aca gtc tct aga tca aac aag atg gat ttc ccc 288
 Leu Ser Asn Gly Tyr Thr Val Ser Arg Ser Asn Lys Met Asp Phe Pro
 80 85 90
 ctc cta ctg gac tct gtt acc tcc tcc cag aca tct gtg tac ttc tgt 336
 Leu Leu Leu Asp Ser Val Thr Ser Ser Gln Thr Ser Val Tyr Phe Cys

95 100 105 110 339

gcc
Ala

<210> 35
<211> 111
<212> PRT
<213> Canis familiaris

<400> 35
Met Ala Thr Gly Val Phe Phe Gly Met Ala Leu Cys Val Leu Trp Thr
1 5 10 15

Gly Tyr Met Asp Ala Gly Ile Ile Gln Ser Pro Arg Tyr Lys Val Thr
20 25 30

Gly Thr Gly Lys Arg Val Thr Leu Arg Cys His Gln Thr Asp Asn Tyr
35 40 45

Asp Tyr Met Tyr Trp Tyr Arg His Asp Leu Gly His Gly Pro Arg Leu
50 55 60

Ile Tyr Tyr Ser Asn Gly Ile Asn Ser Thr Glu Lys Gly Asp Leu Ser
65 70 75 80

Asn Gly Tyr Thr Val Ser Arg Ser Asn Lys Met Asp Phe Pro Leu Leu
85 90 95

Leu Asp Ser Val Thr Ser Ser Gln Thr Ser Val Tyr Phe Cys Ala
100 105 110

<210> 36
<211> 339
<212> DNA
<213> Canis familiaris

<400> 36
ggcacagaag tacacagatg tctgggagga ggtaacagag tccagtagga gggggaaatc 60
catcttgttt gatctagaga ctgtgtatcc attggagagg tctccttttt cagtgtgttt 120
aataccattt gaataataga tcagcctcgg cccatgtccc aggtcatgtc gataccagta 180
catatagtca tagttgtctg tctggtgaca tctcagagtc accctctttc ctgtccctgt 240
gaccttgat cttgggctct ggataattcc agcatccatg tatcctgtcc acaggacaca 300
aagagccatg ccaaagaaga cgccggtggc catttcagc 339

<210> 37
<211> 423
<212> DNA

<213> Canis familiaris

<220>

<221> CDS

<222> (85)..(423)

<400> 37

aattaaccct cactaaaggg aacaaaaagct ggagctccac cgcggcacga ggagcgggga 60

ggctatcagc ttcccagggc tgcc atg ggc tcc agg ctt ctc tgc tgt gtg 111
Met Gly Ser Arg Leu Leu Cys Cys Val
1 5

gcc ctt tgt ctc ctg gga gcc ggc ccc gtg gag tct gag gtc atc caa 159
Ala Leu Cys Leu Leu Gly Ala Gly Pro Val Glu Ser Glu Val Ile Gln
10 15 20 25

act cca aga cac atg atc aaa gca aga gga cag aca gtg acc ctg aga 207
Thr Pro Arg His Met Ile Lys Ala Arg Gly Gln Thr Val Thr Leu Arg
30 35 40

tgt tcc ctt atc tct gga cac cta tct gtg tac tgg tac caa cag gcc 255
Cys Ser Leu Ile Ser Gly His Leu Ser Val Tyr Trp Tyr Gln Gln Ala
45 50 55

ctg ggc cag ggt ccc cgg ttt ctc att cag tat tac aat agg gaa gag 303
Leu Gly Gln Gly Pro Arg Phe Leu Ile Gln Tyr Tyr Asn Arg Glu Glu
60 65 70

aga gac aaa gga gac atc ccg gca aga ttc tca gtg cag cag ttc agt 351
Arg Asp Lys Gly Asp Ile Pro Ala Arg Phe Ser Val Gln Gln Phe Ser
75 80 85

aac tac agc tcc cag ctg gag atg aac tcc ctg gag cca gga gac tca 399
Asn Tyr Ser Ser Gln Leu Glu Met Asn Ser Leu Glu Pro Gly Asp Ser
90 95 100 105

gcc cta tat ctc tgt gcc agc agc 423
Ala Leu Tyr Leu Cys Ala Ser Ser
110

<210> 38

<211> 113

<212> PRT

<213> Canis familiaris

<400> 38

Met Gly Ser Arg Leu Leu Cys Cys Val Ala Leu Cys Leu Leu Gly Ala
1 5 10 15

Gly Pro Val Glu Ser Glu Val Ile Gln Thr Pro Arg His Met Ile Lys
20 25 30

Ala Arg Gly Gln Thr Val Thr Leu Arg Cys Ser Leu Ile Ser Gly His
35 40 45

Leu Ser Val Tyr Trp Tyr Gln Gln Ala Leu Gly Gln Gly Pro Arg Phe
50 55 60

Leu Ile Gln Tyr Tyr Asn Arg Glu Glu Arg Asp Lys Gly Asp Ile Pro
 65 70 75 80

Ala Arg Phe Ser Val Gln Gln Phe Ser Asn Tyr Ser Ser Gln Leu Glu
 85 90 95

Met Asn Ser Leu Glu Pro Gly Asp Ser Ala Leu Tyr Leu Cys Ala Ser
 100 105 110

Ser

<210> 39
 <211> 423
 <212> DNA
 <213> Canis familiaris

<400> 39
 gctgctggca cagagatata gggctgagtc tcctggctcc agggagtcca tctccagctg 60
 ggagctgtag ttactgaact gctgcactga gaatcttgcc gggatgtctc ctttgtctct 120
 ctcttcccta ttgtaatact gaatgagaaa ccggggaccc tggcccaggg cctgttggtta 180
 ccagtacaca gatagggtgc cagagataag ggaacatctc agggtcactg tctgtcctct 240
 tgctttgatc atgtgtcttg gagtttggat gacctcagac tccacggggc cggctcccag 300
 gagacaaagg gccacacagc agagaagcct ggagcccatt gcagccctgg gaagctgata 360
 gcctccccgc tcctcgtgcc gcggtggagc tccagctttt gttcccttta gtgagggtta 420
 att 423

<210> 40
 <211> 396
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS
 <222> (73)..(396)

<400> 40
 gctgcaggat tcggcacgag gcgtggatcat atctatcttg agagaggtat ggtatgaggc 60
 catcacctga ag atg ctg atg ctt ctg ctg ctc ctg ggg ccc agc tct gga 111
 Met Leu Met Leu Leu Leu Leu Leu Gly Pro Ser Ser Gly
 1 5 10
 ctc ggt gcc ctc gtc ttc cag gcg ccc agc aca atg atc tgt aag agc 159
 Leu Gly Ala Leu Val Phe Gln Ala Pro Ser Thr Met Ile Cys Lys Ser
 15 20 25

| | |
|---|-----|
| gga gcc acc gtg cag atc cag tgt caa aca gtg gac ctt caa gcc aca | 207 |
| Gly Ala Thr Val Gln Ile Gln Cys Gln Thr Val Asp Leu Gln Ala Thr | |
| 30 35 40 45 | |
| | |
| acc gtg ttt tgg tat cgc cag ctc ccg aag cag ggc ctt acc ctt atg | 255 |
| Thr Val Phe Trp Tyr Arg Gln Leu Pro Lys Gln Gly Leu Thr Leu Met | |
| 50 55 60 | |
| | |
| gtg acc tct aac gtg ggc aac agt gct aca cac gag cag ggg ttc cct | 303 |
| Val Thr Ser Asn Val Gly Asn Ser Ala Thr His Glu Gln Gly Phe Pro | |
| 65 70 75 | |
| | |
| gca gcc aag ttc cct gtt aac cac cca aac ctc acg ttt tcc tcc ctg | 351 |
| Ala Ala Lys Phe Pro Val Asn His Pro Asn Leu Thr Phe Ser Ser Leu | |
| 80 85 90 | |
| | |
| atg gtg acg agt tca ggt cct gga gac agc ggc ctc tac ttc tgt | 396 |
| Met Val Thr Ser Ser Gly Pro Gly Asp Ser Gly Leu Tyr Phe Cys | |
| 95 100 105 | |

<210> 41
 <211> 108
 <212> PRT
 <213> Canis familiaris

| | |
|---|--|
| <400> 41 | |
| Met Leu Met Leu Leu Leu Leu Gly Pro Ser Ser Gly Leu Gly Ala | |
| 1 5 10 15 | |
| | |
| Leu Val Phe Gln Ala Pro Ser Thr Met Ile Cys Lys Ser Gly Ala Thr | |
| 20 25 30 | |
| | |
| Val Gln Ile Gln Cys Gln Thr Val Asp Leu Gln Ala Thr Thr Val Phe | |
| 35 40 45 | |
| | |
| Trp Tyr Arg Gln Leu Pro Lys Gln Gly Leu Thr Leu Met Val Thr Ser | |
| 50 55 60 | |
| | |
| Asn Val Gly Asn Ser Ala Thr His Glu Gln Gly Phe Pro Ala Ala Lys | |
| 65 70 75 80 | |
| | |
| Phe Pro Val Asn His Pro Asn Leu Thr Phe Ser Ser Leu Met Val Thr | |
| 85 90 95 | |
| | |
| Ser Ser Gly Pro Gly Asp Ser Gly Leu Tyr Phe Cys | |
| 100 105 | |

<210> 42
 <211> 396
 <212> DNA
 <213> Canis familiaris

<400> 42
 acagaagtag aggccgctgt ctccaggacc tgaactcgtc accatcaggg agggaaaacgt 60

gaggtttggg tggtaaacag ggaacttggc tgcagggaaac ccctgctcgt gtgtagcact 120
 gttgcccacg ttagagggtca ccataagggt aaggccctgc ttcgggagct ggcgatacca 180
 aaacacgggtt gtggcttgaa ggtccactgt ttgacactgg atctgcacgg tggctccgct 240
 cttacagatc attgtgctgg gcgcctggaa gacgagggca ccgagtccag agctggggccc 300
 caggagcagc agaagcatca gcatcttcag gtgatggcct cataccatac ctctctcaag 360
 atagatatga ccacgcctcg tgccgaatcc tgcagc 396

<210> 43
 <211> 354
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS
 <222> (13)..(354)

<400> 43
 cacgagcctg cc atg tgc cca gtg ttc atc tgc tcc ttg gtc ctc tgg ctc 51
 Met Cys Pro Val Phe Ile Cys Ser Leu Val Leu Trp Leu
 1 5 10

 ctg agt aca ggc acc ctc aat gca aaa gtc atg cag act cca gga cat 99
 Leu Ser Thr Gly Thr Leu Asn Ala Lys Val Met Gln Thr Pro Gly His
 15 20 25
 ctg gtc aaa ggg aaa gga caa aaa gca aaa atg gaa tgt gtc cca ata 147
 Leu Val Lys Gly Lys Gly Gln Lys Ala Lys Met Glu Cys Val Pro Ile
 30 35 40 45

 aaa gga cat agt tat gtt ttc tgg tat cag cag atc cca gca aaa gag 195
 Lys Gly His Ser Tyr Val Phe Trp Tyr Gln Gln Ile Pro Ala Lys Glu
 50 55 60

 ttc aag ttc ttg att tct ttc cag gat aac gct gtc ttt gat aaa aca 243
 Phe Lys Phe Leu Ile Ser Phe Gln Asp Asn Ala Val Phe Asp Lys Thr
 65 70 75

 ggg atg ccc acg cag aga ttt tta gcc ttg tgt cca aaa aac cta ccc 291
 Gly Met Pro Thr Gln Arg Phe Leu Ala Leu Cys Pro Lys Asn Leu Pro
 80 85 90

 tgt agc cta gag atc gag cgt aca gag ctg cag gat tca gcc gtg tat 339
 Cys Ser Leu Glu Ile Glu Arg Thr Glu Leu Gln Asp Ser Ala Val Tyr
 95 100 105

 ttt tgt gcc agc agt 354
 Phe Cys Ala Ser Ser
 110

<210> 44
 <211> 114

<212> PRT

<213> Canis familiaris

<400> 44

Met Cys Pro Val Phe Ile Cys Ser Leu Val Leu Trp Leu Leu Ser Thr
1 5 10 15

Gly Thr Leu Asn Ala Lys Val Met Gln Thr Pro Gly His Leu Val Lys
20 25 30

Gly Lys Gly Gln Lys Ala Lys Met Glu Cys Val Pro Ile Lys Gly His
35 40 45

Ser Tyr Val Phe Trp Tyr Gln Gln Ile Pro Ala Lys Glu Phe Lys Phe
50 55 60

Leu Ile Ser Phe Gln Asp Asn Ala Val Phe Asp Lys Thr Gly Met Pro
65 70 75 80

Thr Gln Arg Phe Leu Ala Leu Cys Pro Lys Asn Leu Pro Cys Ser Leu
85 90 95

Glu Ile Glu Arg Thr Glu Leu Gln Asp Ser Ala Val Tyr Phe Cys Ala
100 105 110

Ser Ser

<210> 45

<211> 354

<212> DNA

<213> Canis familiaris

<400> 45

actgctggca caaaaataca cggctgaatc ctgcagctct gtacgctcga tctctaggct 60
acagggtagg ttttttggac acaaggctaa aaatctctgc gtgggcatcc ctgttttacc 120
aaagacagcg ttatcctgga aagaaatcaa gaacttgaac tcttttgctg ggatctgctg 180
ataccagaaa acataactat gtccttttat tgggacacat tccatttttg ctttttgtcc 240
tttccctttg accagatgtc ctggagtctg catgactttt gcattgaggg tgccctgtact 300
caggagccag aggaccaagg agcagatgaa cactgggcac atggcaggct cgtg 354

<210> 46

<211> 369

<212> DNA

<213> Canis familiaris

<220>

<221> CDS

<222> (40)..(369)

<400> 46
ggcacgagca ctgaggacca gactgtgcct gtctccacc atg ggc tcc ggg ttc 54
Met Gly Ser Gly Phe
1 5

ctc tgc tgt atg gtc ctc tgc ctc ctg gga gca gca ccc ctg gac aca 102
Leu Cys Cys Met Val Leu Cys Leu Leu Gly Ala Ala Pro Leu Asp Thr
10 15 20

aca gtt tcc cag act cca aga tac ctc atc gcg cac gtg gga tcg aag 150
Thr Val Ser Gln Thr Pro Arg Tyr Leu Ile Ala His Val Gly Ser Lys
25 30 35

aag tta cta aaa tgt gag caa aat ctg ggc cat aat gct atg tac tgg 198
Lys Leu Leu Lys Cys Glu Gln Asn Leu Gly His Asn Ala Met Tyr Trp
40 45 50

tat aag caa gac ctc aag caa ctg ctg aag atc atg ttt atc tac ttt 246
Tyr Lys Gln Asp Leu Lys Gln Leu Leu Lys Ile Met Phe Ile Tyr Phe
55 60 65

aat cag gga ctc aat cta aat gaa tca gtt cca ggt cgt ttc tca cct 294
Asn Gln Gly Leu Asn Leu Asn Glu Ser Val Pro Gly Arg Phe Ser Pro
70 75 80 85

gag aca ctg aca agc tca tta act tca tgt cga ctc ctg aac agt gac 342
Glu Thr Leu Thr Ser Ser Leu Thr Ser Cys Arg Leu Leu Asn Ser Asp
90 95 100

tct gct gtg tat ttc tgt gcc agc agc 369
Ser Ala Val Tyr Phe Cys Ala Ser Ser
105 110

<210> 47

<211> 110

<212> PRT

<213> Canis familiaris

<400> 47

Met Gly Ser Gly Phe Leu Cys Cys Met Val Leu Cys Leu Leu Gly Ala
1 5 10 15

Ala Pro Leu Asp Thr Thr Val Ser Gln Thr Pro Arg Tyr Leu Ile Ala
20 25 30

His Val Gly Ser Lys Lys Leu Leu Lys Cys Glu Gln Asn Leu Gly His
35 40 45

Asn Ala Met Tyr Trp Tyr Lys Gln Asp Leu Lys Gln Leu Leu Lys Ile
50 55 60

Met Phe Ile Tyr Phe Asn Gln Gly Leu Asn Leu Asn Glu Ser Val Pro
65 70 75 80

Gly Arg Phe Ser Pro Glu Thr Leu Thr Ser Ser Leu Thr Ser Cys Arg
85 90 95

Leu Leu Asn Ser Asp Ser Ala Val Tyr Phe Cys Ala Ser Ser
100 105 110

<210> 48
<211> 369
<212> DNA
<213> Canis familiaris

<400> 48
gctgctggca cagaaatata cagcagagtc actgttcagg agtcgacatg aagttaatga 60
gcttgctcagt gtctcagggtg agaaacgacc tggaactgat tcatttagat tgagtcacctg 120
attaaagtag ataaacatga tcttcagcag ttgcttgagg tcttgcttat accagtacat 180
agcattatgg ccagatattt gctcacattt tagtaacttc ttogatccca cgtgcgcgat 240
gaggtatctt ggagtctggg aaactgttgt gtccaggggt gctgctccca ggaggcagag 300
gaccatacag cagaggaacc cggagcccat ggtggagaca ggcacagtct ggtcctcagt 360
gctcgtgcc 369

<210> 49
<211> 504
<212> DNA
<213> Canis familiaris

<400> 49
gaggatctgc agaaggtcac cctcccaag gtcacagtgt ttgaaccatc ggaagcagag 60
atctcgcgga ccagaaggc cactctgtg tgctggcca cgggcttcta ccccgaccac 120
gtggagctga gctgggtgggt gaacgggaag gaggtcacga gtgggttcag caccgacctg 180
cagccctaca aggagaggcc cagcgagaat gactccagct actgtctgag cagccggctg 240
agggtctctg cctccttctg gcacaacctg cgcaaccact tccgctgcca agtccagttc 300
tatgggctcg gggacgacga tgagtggaaa tacgatagag tcaaaccat caccagaac 360
atcagtgctg aggcctgggg cagagcagac tgtgggttca cctcggtgtc ctaccatcag 420
ggcgtcctgt ctgccaccat cctctatgag atcctgctgg gcaaggccac gctgtatgct 480
gtgctggtca gcatcctggg gctg 504

<210> 50
<211> 19
<212> DNA
<213> Artificial Sequence
<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 50
cgacaagacc caggtctgg 19

<210> 51
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 51
gtcagctccc aggacagag 19

<210> 52
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 52
catgacctgg gacatgggc 19

<210> 53
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 53
gagatgttcc cttatctctg g 21

<210> 54
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 54
cctctaacgt gggcaacag 19

<210> 55
<211> 20
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 55
tcagcagatc ccagcaaaag 20

<210> 56
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 56
agcaagacct caagcaactg 20

<210> 57
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 57
gtgaccttct gcagatcctc 20

<210> 58
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 58
agctcagctc cacgtggtc 19

<210> 59
<211> 19
<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
Primer

<400> 59

tgctgaaccc actcgtgac

19

<210> 60

<211> 109

<212> PRT

<213> Canis familiaris

<220>

<223> At location 109, Xaa = Ala or Ser

<400> 60

Ile Gly Leu Leu Cys Gly Val Ala Phe Cys Phe Leu Gly Val Gly Leu
1 5 10 15

Leu Asn Ala Gln Val Thr Gln Thr Pro Arg Gln Leu Ile Lys Lys Val
20 25 30

Gly Arg Lys Val Leu Leu Lys Cys Ser Gln Asn Met Asp His Glu Arg
35 40 45

Trp Ser Tyr Asn Ile Asp Ser Val Glu Thr Gly Asp Ile Pro Tyr Gly
50 55 60

Met Phe Trp Tyr Gln Gln Asp Pro Gly Leu Gly Leu Arg Leu Leu Tyr
65 70 75 80

Tyr Ser Val Ser Arg Lys Lys Lys Asp Ala Phe Pro Leu Ile Leu Glu
85 90 95

Ser Ala Arg Ile Asn Gln Thr Ser Val Tyr Phe Cys Xaa
100 105

<210> 61

<211> 110

<212> PRT

<213> Canis familiaris

<220>

<223> At locations 109 and 110, Xaa =Ala or Ser

<400> 61

Ile Gly Leu Leu Cys Gly Val Ala Phe Cys Phe Leu Gly Val Gly Leu
1 5 10 15

Leu Asn Ala Gln Val Thr Gln Thr Pro Arg Gln Leu Ile Lys Lys Val
20 25 30

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Arg | Lys | Val | Leu | Leu | Lys | Cys | Ser | Gln | Asn | Met | Asp | His | Glu | Arg |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Trp | Ser | Tyr | Asn | Ile | Asp | Ser | Val | Glu | Thr | Gly | Asp | Ile | Pro | Tyr | Gly |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Met | Phe | Trp | Tyr | Gln | Gln | Asp | Pro | Gly | Leu | Gly | Leu | Arg | Leu | Leu | Tyr |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |
| Tyr | Ser | Val | Ser | Arg | Lys | Lys | Lys | Asp | Ala | Phe | Pro | Leu | Ile | Leu | Glu |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ser | Ala | Arg | Ile | Asn | Gln | Thr | Ser | Val | Tyr | Phe | Cys | Xaa | Xaa | | |
| | | | 100 | | | | | 105 | | | | | 110 | | |

<210> 62
 <211> 111
 <212> PRT
 <213> Canis familiaris

<220>
 <223> At locations 109, 110 and 111, Xaa= Ala or Ser

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gly | Leu | Leu | Cys | Gly | Val | Ala | Phe | Cys | Phe | Leu | Gly | Val | Gly | Leu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Leu | Asn | Ala | Gln | Val | Thr | Gln | Thr | Pro | Arg | Gln | Leu | Ile | Lys | Lys | Val |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Gly | Arg | Lys | Val | Leu | Leu | Lys | Cys | Ser | Gln | Asn | Met | Asp | His | Glu | Arg |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Trp | Ser | Tyr | Asn | Ile | Asp | Ser | Val | Glu | Thr | Gly | Asp | Ile | Pro | Tyr | Gly |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Met | Phe | Trp | Tyr | Gln | Gln | Asp | Pro | Gly | Leu | Gly | Leu | Arg | Leu | Leu | Tyr |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |
| Tyr | Ser | Val | Ser | Arg | Lys | Lys | Lys | Asp | Ala | Phe | Pro | Leu | Ile | Leu | Glu |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ser | Ala | Arg | Ile | Asn | Gln | Thr | Ser | Val | Tyr | Phe | Cys | Xaa | Xaa | Xaa | |
| | | | 100 | | | | | 105 | | | | | 110 | | |

<210> 63
 <211> 109
 <212> PRT
 <213> Canis familiaris

<220>
 <223> At location 109, Xaa =Ala or Ser

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Thr | Cys | Leu | Leu | Leu | Leu | Leu | Gly | Gln | Gly | Ser | Val | Phe | Gly |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | | 5 | | 10 | | 15 | | | | | | | | | |
| Ala | Leu | Val | Ser | Gln | Lys | Pro | Arg | Arg | Asp | Ile | Cys | Gln | Arg | Gly | Thr |
| | | 20 | | | | | | 25 | | | | | 30 | | |
| Ser | Ile | Thr | Ile | His | Cys | Glu | Val | Asp | Thr | Gln | Val | Thr | Leu | Met | Phe |
| | | 35 | | | | | | 40 | | | | 45 | | | |
| Trp | Tyr | Arg | Gln | Leu | Pro | Gly | Gln | Ser | Leu | Ile | Leu | Ile | Ala | Thr | Ala |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ala | Glu | Ala | Thr | Tyr | Glu | Asn | Gln | Gly | Ser | Gly | Phe | Thr | Arg | Glu | Lys |
| | 65 | | | | 70 | | | | | 75 | | | | 80 | |
| Phe | Pro | Ile | Ser | Arg | Arg | Thr | Leu | Met | Phe | Ser | Thr | Leu | Thr | Val | Ser |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Asn | Leu | Ser | Leu | Glu | Asp | Thr | Ser | Ser | Tyr | Phe | Cys | Xaa | | | |
| | | | 100 | | | | | 105 | | | | | | | |

<210> 64
 <211> 110
 <212> PRT
 <213> Canis familiaris

<220>
 <223> At locations 109 and 110, Xaa = Ala or Ser

| |
|---|
| <400> 64 |
| Met Leu Thr Cys Leu Leu Leu Leu Leu Gly Gln Gly Ser Val Phe Gly |
| 1 5 10 15 |
| Ala Leu Val Ser Gln Lys Pro Arg Arg Asp Ile Cys Gln Arg Gly Thr |
| 20 25 30 |
| Ser Ile Thr Ile His Cys Glu Val Asp Thr Gln Val Thr Leu Met Phe |
| 35 40 45 |
| Trp Tyr Arg Gln Leu Pro Gly Gln Ser Leu Ile Leu Ile Ala Thr Ala |
| 50 55 60 |
| Ala Glu Ala Thr Tyr Glu Asn Gln Gly Ser Gly Phe Thr Arg Glu Lys |
| 65 70 75 80 |
| Phe Pro Ile Ser Arg Arg Thr Leu Met Phe Ser Thr Leu Thr Val Ser |
| 85 90 95 |
| Asn Leu Ser Leu Glu Asp Thr Ser Ser Tyr Phe Cys Xaa Xaa |
| 100 105 110 |

<210> 65
 <211> 111
 <212> PRT
 <213> Canis familiaris

<220>

<223> At locations 109, 110 and 111, Xaa =Ala or Ser

<400> 65

Met Leu Thr Cys Leu Leu Leu Leu Leu Gly Gln Gly Ser Val Phe Gly
1 5 10 15

Ala Leu Val Ser Gln Lys Pro Arg Arg Asp Ile Cys Gln Arg Gly Thr
20 25 30

Ser Ile Thr Ile His Cys Glu Val Asp Thr Gln Val Thr Leu Met Phe
35 40 45

Trp Tyr Arg Gln Leu Pro Gly Gln Ser Leu Ile Leu Ile Ala Thr Ala
50 55 60

Ala Glu Ala Thr Tyr Glu Asn Gln Gly Ser Gly Phe Thr Arg Glu Lys
65 70 75 80

Phe Pro Ile Ser Arg Arg Thr Leu Met Phe Ser Thr Leu Thr Val Ser
85 90 95

Asn Leu Ser Leu Glu Asp Thr Ser Ser Tyr Phe Cys Xaa Xaa Xaa
100 105 110

<210> 66

<211> 111

<212> PRT

<213> Canis familiaris

<220>

<223> At location 111, Xaa = Ala or Ser

<400> 66

Met Ala Thr Gly Val Phe Phe Gly Met Ala Leu Cys Val Leu Trp Thr
1 5 10 15

Gly Tyr Met Asp Ala Gly Ile Ile Gln Ser Pro Arg Tyr Lys Val Thr
20 25 30

Gly Thr Gly Lys Arg Val Thr Leu Arg Cys His Gln Thr Asp Asn Tyr
35 40 45

Asp Tyr Met Tyr Trp Tyr Arg His Asp Leu Gly His Gly Pro Arg Leu
50 55 60

Ile Tyr Tyr Ser Asn Gly Ile Asn Ser Thr Glu Lys Gly Asp Leu Ser
65 70 75 80

Asn Gly Tyr Thr Val Ser Arg Ser Asn Lys Met Asp Phe Pro Leu Leu
85 90 95

Leu Asp Ser Val Thr Ser Ser Gln Thr Ser Val Tyr Phe Cys Xaa
100 105 110

<210> 67

<211> 112

<212> PRT

<213> Canis familiaris

<220>

<223> At locations 111 and 112, Xaa = Ala or Ser

<400> 67

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Thr | Gly | Val | Phe | Phe | Gly | Met | Ala | Leu | Cys | Val | Leu | Trp | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Tyr | Met | Asp | Ala | Gly | Ile | Ile | Gln | Ser | Pro | Arg | Tyr | Lys | Val | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Thr | Gly | Lys | Arg | Val | Thr | Leu | Arg | Cys | His | Gln | Thr | Asp | Asn | Tyr |
| | | 35 | | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Tyr | Met | Tyr | Trp | Tyr | Arg | His | Asp | Leu | Gly | His | Gly | Pro | Arg | Leu |
| | 50 | | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Tyr | Tyr | Ser | Asn | Gly | Ile | Asn | Ser | Thr | Glu | Lys | Gly | Asp | Leu | Ser |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Gly | Tyr | Thr | Val | Ser | Arg | Ser | Asn | Lys | Met | Asp | Phe | Pro | Leu | Leu |
| | | | | 85 | | | | | 90 | | | | | 95 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Asp | Ser | Val | Thr | Ser | Ser | Gln | Thr | Ser | Val | Tyr | Phe | Cys | Xaa | Xaa |
| | | | 100 | | | | | 105 | | | | | 110 | | |

<210> 68

<211> 113

<212> PRT

<213> Canis familiaris

<220>

<223> At locations 111, 112 and 113, Xaa = Ala or Ser

<400> 68

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Thr | Gly | Val | Phe | Phe | Gly | Met | Ala | Leu | Cys | Val | Leu | Trp | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Gly | Tyr | Met | Asp | Ala | Gly | Ile | Ile | Gln | Ser | Pro | Arg | Tyr | Lys | Val | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Thr | Gly | Lys | Arg | Val | Thr | Leu | Arg | Cys | His | Gln | Thr | Asp | Asn | Tyr |
| | | 35 | | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Tyr | Met | Tyr | Trp | Tyr | Arg | His | Asp | Leu | Gly | His | Gly | Pro | Arg | Leu |
| | 50 | | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Tyr | Tyr | Ser | Asn | Gly | Ile | Asn | Ser | Thr | Glu | Lys | Gly | Asp | Leu | Ser |
| 65 | | | | | 70 | | | | | 75 | | | | 80 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Gly | Tyr | Thr | Val | Ser | Arg | Ser | Asn | Lys | Met | Asp | Phe | Pro | Leu | Leu |
| | | | | 85 | | | | | 90 | | | | | 95 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Asp | Ser | Val | Thr | Ser | Ser | Gln | Thr | Ser | Val | Tyr | Phe | Cys | Xaa | Xaa |
| | | | 100 | | | | | 105 | | | | | 110 | | |

Xaa

<210> 69
<211> 111
<212> PRT
<213> Canis familiaris

<220>
<223> At location 111, Xaa = Ala or Ser

<400> 69
Met Gly Ser Arg Leu Leu Cys Cys Val Ala Leu Cys Leu Leu Gly Ala
1 5 10 15
Gly Pro Val Glu Ser Glu Val Ile Gln Thr Pro Arg His Met Ile Lys
20 25 30
Ala Arg Gly Gln Thr Val Thr Leu Arg Cys Ser Leu Ile Ser Gly His
35 40 45
Leu Ser Val Tyr Trp Tyr Gln Gln Ala Leu Gly Gln Gly Pro Arg Phe
50 55 60
Leu Ile Gln Tyr Tyr Asn Arg Glu Glu Arg Asp Lys Gly Asp Ile Pro
65 70 75 80
Ala Arg Phe Ser Val Gln Gln Phe Ser Asn Tyr Ser Ser Gln Leu Glu
85 90 95
Met Asn Ser Leu Glu Pro Gly Asp Ser Ala Leu Tyr Leu Cys Xaa
100 105 110

<210> 70
<211> 112
<212> PRT
<213> Canis familiaris

<220>
<223> At locations 111 and 112, Xaa = Ala or Ser

<400> 70
Met Gly Ser Arg Leu Leu Cys Cys Val Ala Leu Cys Leu Leu Gly Ala
1 5 10 15
Gly Pro Val Glu Ser Glu Val Ile Gln Thr Pro Arg His Met Ile Lys
20 25 30
Ala Arg Gly Gln Thr Val Thr Leu Arg Cys Ser Leu Ile Ser Gly His
35 40 45
Leu Ser Val Tyr Trp Tyr Gln Gln Ala Leu Gly Gln Gly Pro Arg Phe
50 55 60

Leu Ile Gln Tyr Tyr Asn Arg Glu Glu Arg Asp Lys Gly Asp Ile Pro
65 70 75 80

Ala Arg Phe Ser Val Gln Gln Phe Ser Asn Tyr Ser Ser Gln Leu Glu
85 90 95

Met Asn Ser Leu Glu Pro Gly Asp Ser Ala Leu Tyr Leu Cys Xaa Xaa
100 105 110

<210> 71

<211> 113

<212> PRT

<213> Canis familiaris

<220>

<223> At locations 111, 112 and 113, Xaa = Ala or Ser

<400> 71

Met Gly Ser Arg Leu Leu Cys Cys Val Ala Leu Cys Leu Leu Gly Ala
1 5 10 15

Gly Pro Val Glu Ser Glu Val Ile Gln Thr Pro Arg His Met Ile Lys
20 25 30

Ala Arg Gly Gln Thr Val Thr Leu Arg Cys Ser Leu Ile Ser Gly His
35 40 45

Leu Ser Val Tyr Trp Tyr Gln Gln Ala Leu Gly Gln Gly Pro Arg Phe
50 55 60

Leu Ile Gln Tyr Tyr Asn Arg Glu Glu Arg Asp Lys Gly Asp Ile Pro
65 70 75 80

Ala Arg Phe Ser Val Gln Gln Phe Ser Asn Tyr Ser Ser Gln Leu Glu
85 90 95

Met Asn Ser Leu Glu Pro Gly Asp Ser Ala Leu Tyr Leu Cys Xaa Xaa
100 105 110

Xaa

<210> 72

<211> 109

<212> PRT

<213> Canis familiaris

<220>

<223> At location 109, Xaa = Ala or Ser

<400> 72

Met Leu Met Leu Leu Leu Leu Gly Pro Ser Ser Gly Leu Gly Ala
1 5 10 15

Leu Val Phe Gln Ala Pro Ser Thr Met Ile Cys Lys Ser Gly Ala Thr
20 25 30

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Gln | Ile | Gln | Cys | Gln | Thr | Val | Asp | Leu | Gln | Ala | Thr | Thr | Val | Phe |
| | | | 35 | | | | | 40 | | | | | 45 | | |
| Trp | Tyr | Arg | Gln | Leu | Pro | Lys | Gln | Gly | Leu | Thr | Leu | Met | Val | Thr | Ser |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Asn | Val | Gly | Asn | Ser | Ala | Thr | His | Glu | Gln | Gly | Phe | Pro | Ala | Ala | Lys |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |
| Phe | Pro | Val | Asn | His | Pro | Asn | Leu | Thr | Phe | Ser | Ser | Leu | Met | Val | Thr |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ser | Ser | Gly | Pro | Gly | Asp | Ser | Gly | Leu | Tyr | Phe | Cys | Xaa | | | |
| | | | 100 | | | | | 105 | | | | | | | |

<210> 73
 <211> 110
 <212> PRT
 <213> Canis familiaris

<220>
 <223> At location 109 and 110, Xaa = Ala or Ser

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Met | Leu | Leu | Leu | Leu | Gly | Pro | Ser | Ser | Gly | Leu | Gly | Ala | |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Leu | Val | Phe | Gln | Ala | Pro | Ser | Thr | Met | Ile | Cys | Lys | Ser | Gly | Ala | Thr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Val | Gln | Ile | Gln | Cys | Gln | Thr | Val | Asp | Leu | Gln | Ala | Thr | Thr | Val | Phe |
| | | | 35 | | | | | 40 | | | | | 45 | | |
| Trp | Tyr | Arg | Gln | Leu | Pro | Lys | Gln | Gly | Leu | Thr | Leu | Met | Val | Thr | Ser |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Asn | Val | Gly | Asn | Ser | Ala | Thr | His | Glu | Gln | Gly | Phe | Pro | Ala | Ala | Lys |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |
| Phe | Pro | Val | Asn | His | Pro | Asn | Leu | Thr | Phe | Ser | Ser | Leu | Met | Val | Thr |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Ser | Ser | Gly | Pro | Gly | Asp | Ser | Gly | Leu | Tyr | Phe | Cys | Xaa | Xaa | | |
| | | | 100 | | | | | 105 | | | | | 110 | | |

<210> 74
 <211> 111
 <212> PRT
 <213> Canis familiaris

<220>
 <223> At locations 109, 110 and 111, Xaa = Ala or Ser

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Met | Leu | Leu | Leu | Leu | Gly | Pro | Ser | Ser | Gly | Leu | Gly | Ala |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| | | | |
|---|-----|-----|-----|
| 1 | 5 | 10 | 15 |
| Leu Val Phe Gln Ala Pro Ser Thr Met Ile Cys Lys Ser Gly Ala Thr | 20 | 25 | 30 |
| Val Gln Ile Gln Cys Gln Thr Val Asp Leu Gln Ala Thr Thr Val Phe | 35 | 40 | 45 |
| Trp Tyr Arg Gln Leu Pro Lys Gln Gly Leu Thr Leu Met Val Thr Ser | 50 | 55 | 60 |
| Asn Val Gly Asn Ser Ala Thr His Glu Gln Gly Phe Pro Ala Ala Lys | 65 | 70 | 75 |
| Phe Pro Val Asn His Pro Asn Leu Thr Phe Ser Ser Leu Met Val Thr | 85 | 90 | 95 |
| Ser Ser Gly Pro Gly Asp Ser Gly Leu Tyr Phe Cys Xaa Xaa Xaa | 100 | 105 | 110 |

<210> 75
 <211> 112
 <212> PRT
 <213> Canis familiaris
 <220>
 <223> At location 112, Xaa = Ala or Ser

| |
|---|
| <400> 75 |
| Met Cys Pro Val Phe Ile Cys Ser Leu Val Leu Trp Leu Leu Ser Thr |
| 1 5 10 15 |
| Gly Thr Leu Asn Ala Lys Val Met Gln Thr Pro Gly His Leu Val Lys |
| 20 25 30 |
| Gly Lys Gly Gln Lys Ala Lys Met Glu Cys Val Pro Ile Lys Gly His |
| 35 40 45 |
| Ser Tyr Val Phe Trp Tyr Gln Gln Ile Pro Ala Lys Glu Phe Lys Phe |
| 50 55 60 |
| Leu Ile Ser Phe Gln Asp Asn Ala Val Phe Asp Lys Thr Gly Met Pro |
| 65 70 75 80 |
| Thr Gln Arg Phe Leu Ala Leu Cys Pro Lys Asn Leu Pro Cys Ser Leu |
| 85 90 95 |
| Glu Ile Glu Arg Thr Glu Leu Gln Asp Ser Ala Val Tyr Phe Cys Xaa |
| 100 105 110 |

<210> 76
 <211> 113
 <212> PRT
 <213> Canis familiaris
 <220>

<223> At location 112 and 113, Xaa = Ala or Ser

<400> 76

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Cys | Pro | Val | Phe | Ile | Cys | Ser | Leu | Val | Leu | Trp | Leu | Leu | Ser | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Thr | Leu | Asn | Ala | Lys | Val | Met | Gln | Thr | Pro | Gly | His | Leu | Val | Lys |
| | | | 20 | | | | | 25 | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Lys | Gly | Gln | Lys | Ala | Lys | Met | Glu | Cys | Val | Pro | Ile | Lys | Gly | His |
| | | 35 | | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Tyr | Val | Phe | Trp | Tyr | Gln | Gln | Ile | Pro | Ala | Lys | Glu | Phe | Lys | Phe |
| | 50 | | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ile | Ser | Phe | Gln | Asp | Asn | Ala | Val | Phe | Asp | Lys | Thr | Gly | Met | Pro |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Gln | Arg | Phe | Leu | Ala | Leu | Cys | Pro | Lys | Asn | Leu | Pro | Cys | Ser | Leu |
| | | | | 85 | | | | | 90 | | | | | 95 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Ile | Glu | Arg | Thr | Glu | Leu | Gln | Asp | Ser | Ala | Val | Tyr | Phe | Cys | Xaa |
| | | | 100 | | | | | 105 | | | | | 110 | | |

Xaa

<210> 77

<211> 114

<212> PRT

<213> Canis familiaris

<220>

<223> At location 112, 113 and 114, Xaa = Ala or Ser

<400> 77

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Cys | Pro | Val | Phe | Ile | Cys | Ser | Leu | Val | Leu | Trp | Leu | Leu | Ser | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Thr | Leu | Asn | Ala | Lys | Val | Met | Gln | Thr | Pro | Gly | His | Leu | Val | Lys |
| | | | 20 | | | | | 25 | | | | | 30 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Lys | Gly | Gln | Lys | Ala | Lys | Met | Glu | Cys | Val | Pro | Ile | Lys | Gly | His |
| | | 35 | | | | | 40 | | | | | 45 | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Tyr | Val | Phe | Trp | Tyr | Gln | Gln | Ile | Pro | Ala | Lys | Glu | Phe | Lys | Phe |
| | 50 | | | | | 55 | | | | | 60 | | | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ile | Ser | Phe | Gln | Asp | Asn | Ala | Val | Phe | Asp | Lys | Thr | Gly | Met | Pro |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Gln | Arg | Phe | Leu | Ala | Leu | Cys | Pro | Lys | Asn | Leu | Pro | Cys | Ser | Leu |
| | | | | 85 | | | | | 90 | | | | | 95 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Ile | Glu | Arg | Thr | Glu | Leu | Gln | Asp | Ser | Ala | Val | Tyr | Phe | Cys | Xaa |
| | | | 100 | | | | | 105 | | | | | 110 | | |

Xaa Xaa

<210> 78
<211> 108
<212> PRT
<213> Canis familiaris

<220>
<223> At location 108, Xaa = Ala or Ser

<400> 78
Met Gly Ser Gly Phe Leu Cys Cys Met Val Leu Cys Leu Leu Gly Ala
1 5 10 15
Ala Pro Leu Asp Thr Thr Val Ser Gln Thr Pro Arg Tyr Leu Ile Ala
20 25 30
His Val Gly Ser Lys Lys Leu Leu Lys Cys Glu Gln Asn Leu Gly His
35 40 45
Asn Ala Met Tyr Trp Tyr Lys Gln Asp Leu Lys Gln Leu Leu Lys Ile
50 55 60
Met Phe Ile Tyr Phe Asn Gln Gly Leu Asn Leu Asn Glu Ser Val Pro
65 70 75 80
Gly Arg Phe Ser Pro Glu Thr Leu Thr Ser Ser Leu Thr Ser Cys Arg
85 90 95
Leu Leu Asn Ser Asp Ser Ala Val Tyr Phe Cys Xaa
100 105

<210> 79
<211> 109
<212> PRT
<213> Canis familiaris

<220>
<223> At locations 108 and 109, Xaa = Ala or Ser

<400> 79
Met Gly Ser Gly Phe Leu Cys Cys Met Val Leu Cys Leu Leu Gly Ala
1 5 10 15
Ala Pro Leu Asp Thr Thr Val Ser Gln Thr Pro Arg Tyr Leu Ile Ala
20 25 30
His Val Gly Ser Lys Lys Leu Leu Lys Cys Glu Gln Asn Leu Gly His
35 40 45
Asn Ala Met Tyr Trp Tyr Lys Gln Asp Leu Lys Gln Leu Leu Lys Ile
50 55 60
Met Phe Ile Tyr Phe Asn Gln Gly Leu Asn Leu Asn Glu Ser Val Pro

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 65 | | 70 | | 75 | | 80 | | | | | | | | | |
| Gly | Arg | Phe | Ser | Pro | Glu | Thr | Leu | Thr | Ser | Ser | Leu | Thr | Ser | Cys | Arg |
| | | | | 85 | | | | | 90 | | | | | 95 | |

| | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Leu | Asn | Ser | Asp | Ser | Ala | Val | Tyr | Phe | Cys | Xaa | Xaa |
| | | 100 | | | | | 105 | | | | | |

<210> 80
 <211> 110
 <212> PRT
 <213> Canis familiaris

<220>
 <223> At locations 108, 109 and 110, Xaa = Ala or Ser

| |
|---|
| <400> 80 |
| Met Gly Ser Gly Phe Leu Cys Cys Met Val Leu Cys Leu Leu Gly Ala |
| 1 5 10 15 |

| |
|---|
| Ala Pro Leu Asp Thr Thr Val Ser Gln Thr Pro Arg Tyr Leu Ile Ala |
| 20 25 30 |

| |
|---|
| His Val Gly Ser Lys Lys Leu Leu Lys Cys Glu Gln Asn Leu Gly His |
| 35 40 45 |

| |
|---|
| Asn Ala Met Tyr Trp Tyr Lys Gln Asp Leu Lys Gln Leu Leu Lys Ile |
| 50 55 60 |

| |
|---|
| Met Phe Ile Tyr Phe Asn Gln Gly Leu Asn Leu Asn Glu Ser Val Pro |
| 65 70 75 80 |

| |
|---|
| Gly Arg Phe Ser Pro Glu Thr Leu Thr Ser Ser Leu Thr Ser Cys Arg |
| 85 90 95 |

| |
|---|
| Leu Leu Asn Ser Asp Ser Ala Val Tyr Phe Cys Xaa Xaa Xaa |
| 100 105 110 |

<210> 81
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<220>
 <223> Y = T or C , R = G or A, N = A, C, G, or T

<400> 81
 ccgaattctg gtaycrnca

19

<210> 82
 <211> 18
 <212> DNA

<213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer
 <220>
 <223> R = G or A
 <400> 82
 cggatccgcr cartarta 18

<210> 83
 <211> 18
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer
 <220>
 <223> R = G or A
 <400> 83
 cggatccgcr caraarta 18

<210> 84
 <211> 19
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer
 <400> 84
 ccagacctgg gtcttgctg 19

<210> 85
 <211> 18
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer
 <400> 85
 ctctgtcctg ggagctga 18

<210> 86
 <211> 21

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 86
 ttgtttgatc tagagactgt g 21

 <210> 87
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 87
 atcggactcc tctgtggtgt 20

 <210> 88
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 88
 acggtgaagg gctagcacct 20

 <210> 89
 <211> 20
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

 <400> 89
 gctgaaatgg ccaccggcgt 20

 <210> 90
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic

Primer

<400> 90
ctgttgccca cgtttagagg 19

<210> 91
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 91
ttactgaact gctgcactg 19

<210> 92
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 92
gctgcaggat tcggcacgag 20

<210> 93
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 93
tacgactgtc agcttggtcc 20

<210> 94
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
Primer

<400> 94
cttttgctgg gatctgctga 20

<210> 95
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 95
 cagttgctta ggtcttgct 19

<210> 96
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 96
 cacgagcctg ccatgtgccc 20

<210> 97
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Primer

<400> 97
 ggcacgagca ctgaggacca 20

<210> 98
 <211> 438
 <212> DNA
 <213> Canis familiaris

<220>
 <221> CDS
 <222> (40)..(438)

<400> 98
 cacgaggagc ggggaggcta tcagcttccc agggctgcc atg ggc tcc agg ctt 54
 Met Gly Ser Arg Leu
 1 5

ctc tgc tgt gtg gcc ctt tgt ctc ctg gga gcc ggc ccc gtg gag tct 102
 Leu Cys Cys Val Ala Leu Cys Leu Leu Gly Ala Gly Pro Val Glu Ser
 10 15 20

gag gtc atc caa act cca aga cac atg atc aaa gca aga gga cag aca 150
 Glu Val Ile Gln Thr Pro Arg His Met Ile Lys Ala Arg Gly Gln Thr
 25 30 35

gtg acc ctg aga tgt tcc ctt atc tct gga cac cta tct gtg tac tgg 198
 Val Thr Leu Arg Cys Ser Leu Ile Ser Gly His Leu Ser Val Tyr Trp
 40 45 50

tac caa cag gcc ctg ggc cag ggt ccc cgg ttt ctc att cag tat tac 246
 Tyr Gln Gln Ala Leu Gly Gln Gly Pro Arg Phe Leu Ile Gln Tyr Tyr
 55 60 65

aat agg gaa gag aga gac aaa gga gac atc ccg gca aga ttc tca gtg 294
 Asn Arg Glu Glu Arg Asp Lys Gly Asp Ile Pro Ala Arg Phe Ser Val
 70 75 80 85

cag cag ttc agt aac tac agc tcc cag ctg gag atg aac tcc ctg gag 342
 Gln Gln Phe Ser Asn Tyr Ser Ser Gln Leu Glu Met Asn Ser Leu Glu
 90 95 100

cca gga gac tca gcc cta tat ctc tgt gcc agc agc tta gat gcg ttc 390
 Pro Gly Asp Ser Ala Leu Tyr Leu Cys Ala Ser Ser Leu Asp Ala Phe
 105 110 115

gac gcg ggg cag ctg tac ttc ggg gcc ggt tcc aag ctg gcc gtg ctg 438
 Asp Ala Gly Gln Leu Tyr Phe Gly Ala Gly Ser Lys Leu Ala Val Leu
 120 125 130

<210> 99

<211> 133

<212> PRT

<213> Canis familiaris

<400> 99

Met Gly Ser Arg Leu Leu Cys Cys Val Ala Leu Cys Leu Leu Gly Ala
 1 5 10 15

Gly Pro Val Glu Ser Glu Val Ile Gln Thr Pro Arg His Met Ile Lys
 20 25 30

Ala Arg Gly Gln Thr Val Thr Leu Arg Cys Ser Leu Ile Ser Gly His
 35 40 45

Leu Ser Val Tyr Trp Tyr Gln Gln Ala Leu Gly Gln Gly Pro Arg Phe
 50 55 60

Leu Ile Gln Tyr Tyr Asn Arg Glu Glu Arg Asp Lys Gly Asp Ile Pro
 65 70 75 80

Ala Arg Phe Ser Val Gln Gln Phe Ser Asn Tyr Ser Ser Gln Leu Glu
 85 90 95

Met Asn Ser Leu Glu Pro Gly Asp Ser Ala Leu Tyr Leu Cys Ala Ser
 100 105 110

Ser Leu Asp Ala Phe Asp Ala Gly Gln Leu Tyr Phe Gly Ala Gly Ser
 115 120 125

Lys Leu Ala Val Leu
 130

<210> 100
 <211> 438
 <212> DNA
 <213> Canis familiaris

<400> 100
 cagcacggcc agcttggaa cggccccgaa gtacagctgc cccgcgtcga acgcatctaa 60
 gctgctggca cagagatata gggctgagtc tcttggtcc agggagtcca tctccagctg 120
 ggagctgtag ttactgaact gctgcactga gaattctgcc gggatgtctc ctttgtctct 180
 ctcttccta ttgtaatact gaatgagaaa ccggggaccc tggcccaggg cctgttggtta 240
 ccagtacaca gataggtgtc cagagataag ggaacatctc agggtcactg tctgtcctct 300
 tgctttgatc atgtgtcttg gagtttggat gacctcagac tccacggggc cggctcccag 360
 gagacaaagg gccacacagc agagaagcct ggagcccatg gcagccctgg gaagctgata 420
 gctccccgc tctcgtg 438